

### **REMARKS**

This Preliminary Amendment is filed to insert headings to conform the application to U.S. practice and to correct informalities in the specification, claims and abstract resulting from a literal translation of the French text.

Early action on the merits is earnestly solicited.

Respectfully submitted,

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**Amended claims showing changes made to claims using underlining and brackets:**

1           1.       (Amended) [Method] A method for loading applications into modules  
2 of an embedded system [comprising] having a runtime environment including a  
3 virtual machine comprising an intermediate pseudocode language interpreter and  
4 application programming interfaces (API), from a station on which [the] a source  
5 code of the application is written, compiled into pseudocode by a compiler (82),  
6 verified by a verifier (91), converted by a converter (92) and loaded by a loader (93,  
7 68), is characterized in that:

8               - assigning an identifier to each module (MID), and a reference number to  
9 each class (NCI), each method (NM) and each attribute (NA) encapsulated in  
10 classes of a module so as to statically link [the conversion comprises the  
11 performance of the static linking of] a plurality of sets of packages to be stored in the  
12 same name space in the embedded system to effect conversion by the converter  
13 (92), [called modules, by assigning an identifier to each module (MID), and a  
14 reference number to each class (NCI), each method (NM) and each attribute (NA)  
15 encapsulated in the classes of the module,]

16               - coding the reference to a method or an attribute in the linked pseudocode of  
17 a module[, being coded] in three bytes constituted by an indicator indicating the  
18 reference to a class internal (II) or external (IE) to the module, the number of the  
19 class (NCI), and either the number of the method (NM) or the number of the attribute  
20 (NA), and

21               - [the modules loaded are] loading one or more application program interface  
22 modules comprising system classes or service modules, each corresponding to an

23 application, a reference (IE) to an external class being systematically interpreted by  
24 the virtual machine as a reference to an application program interface module.

1           2.       (Amended) [Method] A method for loading applications into an  
2 embedded system according to claim 1, characterized in that the loading of the  
3 modules into the embedded system comprises [the storage] storing of at least one  
4 module array (69, 101, 103) representing the modules, the number (IMi) between 0  
5 and n associated by the linker with a module constituting the index of said module in  
6 the array, [and a table (70, 102, 104)] storing the association of the index in the array  
7 representing the identifier (MID) of said module in a table (70, 102, 104), said array  
8 and the table being in programmable nonvolatile memory, an external reference (IE)  
9 to an external module in the pseudocode [being interpreted by the interpreter of the  
10 virtual machine] interpreting as constituting an index for access to the module  
11 equivalent to the one in the module array.

1           3.       (Amended) [Method] A method for loading applications into an  
2 embedded system according to claim 2, characterized in that the loading of the  
3 modules comprises the storage, for each module, of an array (TRC) representing its  
4 classes, comprising a reference to the index of its module and, for each class, an  
5 array representing attributes (TRA) and methods (TRMe).

1           4.       (Amended) [Method] A method for loading applications into an  
2 embedded system according to claim 2, characterized in that the modules are  
3 referenced in a single module array, interpreting [the] system classes [are]  
4 different from n [will be interpreted] by the virtual machine as a reference to said  
5 API module.

1           5.       (Amended) [Method] A method for loading applications into an  
2 embedded system according to claim 4, characterized in that the classes being  
3 declared public, or in private packages, the attributes and methods being  
4 declared protected, in private packages or in private classes, the numbering of  
5 the classes is done in order of the public classes followed by the classes in  
6 private packages; the numbering of the attributes or methods is done by the  
7 converter (92) in order of the attributes or methods that are public, protected in  
8 private packages, and in private classes.

1           6.       (Amended) [Method] A method for loading applications into an  
2 embedded system according to claim 2, [characterized in that the] further  
3 comprising containing system classes [are] contained in several API modules  
4 that can be loaded separately, [the loader (68) maintains] maintaining in the  
5 programmable nonvolatile memory two arrays representing modules and two  
6 corresponding MID/IMi association tables, one for the API modules and the other  
7 for the non-API modules, [the loader] and loading the modules into one of the  
8 two arrays based on the nature of the module specified in its header, any

9 external reference of a module of the module array being interpreted as a  
10 reference to the index of the API module.

1 7. (Amended) [Method] A method for loading applications into an  
2 embedded system according to claim 6, characterized in that static linking of a  
3 module is performed [in] such [a way] that the reference to a class external to a  
4 non-API module in the intermediate pseudocode is an index in an array of the  
5 header of the module, wherein each entry is an identifier (MID) of a referenced  
6 API module, the loading of said module into the target platform comprising the  
7 replacement of said reference with the number of the index of the API module  
8 obtained from the identifier (MID) in the MID/IMi association tables of the API  
9 modules.

1 8. (Amended) [Embedded] An embedded system comprising a virtual  
2 machine and an API platform including application program interfaces, a fixed  
3 nonvolatile memory, a programmable [or modifiable] nonvolatile memory, and a  
4 random access memory, [is characterized in that] the programmable nonvolatile  
5 memory [comprises] comprising at least one API module comprising system  
6 classes and service modules, at least one array representing modules (TRM), in  
7 which the modules are indexed, and a table (70, 104) associating [the] an index  
8 (IM) of a module in the representing array with [the] an identifier (MID) of said  
9 module, each module comprising an array for representing classes (TRC), in  
10 which the classes are indexed and in which each class has a reference to the

11 index (IM) of its module, each class comprising an array for representing  
12 attributes (TRA) and methods (TRMe), in which the attributes and methods are  
13 indexed, the reference to a method or an attribute being coded in at least three  
14 bytes corresponding to a reference to a class internal (II) or external (IE) to the  
15 module, a reference external to the module constituting the index of the API  
16 module in the module array, a class number (NCI) corresponding to the index of  
17 the class in the table representing the classes of the module, and a method (NM)  
18 or attribute (NA) number corresponding to the index or the method or the  
19 attribute in the array representing the methods or attributes of the class of the  
20 module.

1 9. (Amended) [Embedded] An embedded system according to claim  
2 8, [characterized in that it includes] further comprising means for comparing the  
3 first byte of the three bytes encoding a reference to a method or an attribute to a  
4 given value n in order to decide whether it is an internal or an external class.

1 10. (Amended) [Embedded] An embedded system according to claim  
2 8, [characterized in that it comprises] wherein a main module [comprising]  
3 comprises the main program of the system.

1 11. (Amended) [Embedded] An embedded system according to claim  
2 8, characterized in that it the classes are indexed in order of the public classes  
3 followed by the classes in private packages, and the attributes and methods are

4 indexed in the order of the attributes or methods that are public, protected, in  
5 private packages, and in private classes.

1 12. (Amended) [Embedded] An embedded system according to claim  
2 11, characterized in that the programmable nonvolatile memory comprises  
3 several API modules comprising system classes, two arrays (101, 103)  
4 representing modules, one for the API modules and the other for the non-API  
5 modules and the main module, and two MID/IMi association tables (102, 104),  
6 each corresponding to an array representing modules.

1 13. (Amended) [Embedded] An embedded system according to claim  
2 10, [characterized in that it comprises] further comprising an access manager  
3 class "Access Manager" of an API module (105) comprising a method [that  
4 makes it possible to create] for creating an instance of a service module, via the  
5 main module, said class having a protection that prohibits it from having more  
6 than one instance.

1 14. (Amended) [Method] A method for executing an application of a  
2 multi-application embedded system[, comprising] having a runtime environment  
3 including a virtual machine comprising an intermediate pseudocode language  
4 interpreter and application programming interfaces (API), is characterized in that  
5 during the execution of the intermediate pseudocode of a service module,  
6 corresponding to an application, referenced in a module array, the reference to a

7 method or an attribute in the pseudocode, coded in at least three bytes  
8 corresponding to a reference to a class internal (II) or external (IE) to the module,  
9 a class number (NCI) and a method (NM) or attribute (NA) number, a reference  
10 external to the module is interpreted by the virtual machine as a reference to the  
11 index of an API module in the array of the API module or modules.

1 15. (Amended) [Method] A method for executing an application of a  
2 multi-application embedded system according to claim 14, characterized in that,  
3 upon reception of a request for execution of a service module having an identifier  
4 (MID), the runtime environment accesses the input class of a main module  
5 comprising the main program of the system, the main module installs an  
6 instance of a special class "Access Manager" of an API module that controls  
7 access to a service module and uses a method of this class for creating an  
8 instance of the input class of the requested service module, by means of a table  
9 associating the identifier with the index of the module in an array in which the  
10 module is referenced, the instance being returned by the method to the main  
11 program.